SIXPENCE

JULY 1943

AMATEUR RADIO

THE
OFFICIAL ORGAN
OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA

Published by the Victorian Division

AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol 11. No. 7 July, 1943.

FREQUENCY MODULATION

.. Part 2 ..

By R. A. Priddle. VK2RA

.....

--- RECEIVERS ---

The frequency modulation receiver should respond only to frequency variations, and if full advantage is to be taken of the noise discrimination characteristics of frequency modulation there should be no response to amplitude variations. The detection of the frequency variations is performed in a "discriminator" stage which takes the place of the second detector in an ordinary superheterodyne. Any variations in amplitude of the incoming signal or noise are ironed out by incorporating a "limiter" immediately before the discriminator.

For effective operation weak signals should be amplified sufficiently to saturate the limiter, so that high RF and IF gain are necessary. For this reason an IF of about 5Mc/s is commonly used. This frequency also gives the greater bandwidth necessary for wide-band frequency modulation.

It is desirable to cut off the higher audio frequencies by a low-pass filter, since high frequency noise components have the greater amplitude.

LIMITERS .. The usual limiter circuits use a pentode with low plate and screen voltages, so that the plate current flow is limited. This is shown in a single stage limiter in Fig. 1.

The time constant of R1 C1 determines the speed of operation of the limiter. Fast operation is necessary for noise impulses, but a large time constant is better for amplitude variations of the signal. This is usually overcome by using a "cascade limiter", an example of which is shown in the frequency modulation adaptor to be described.

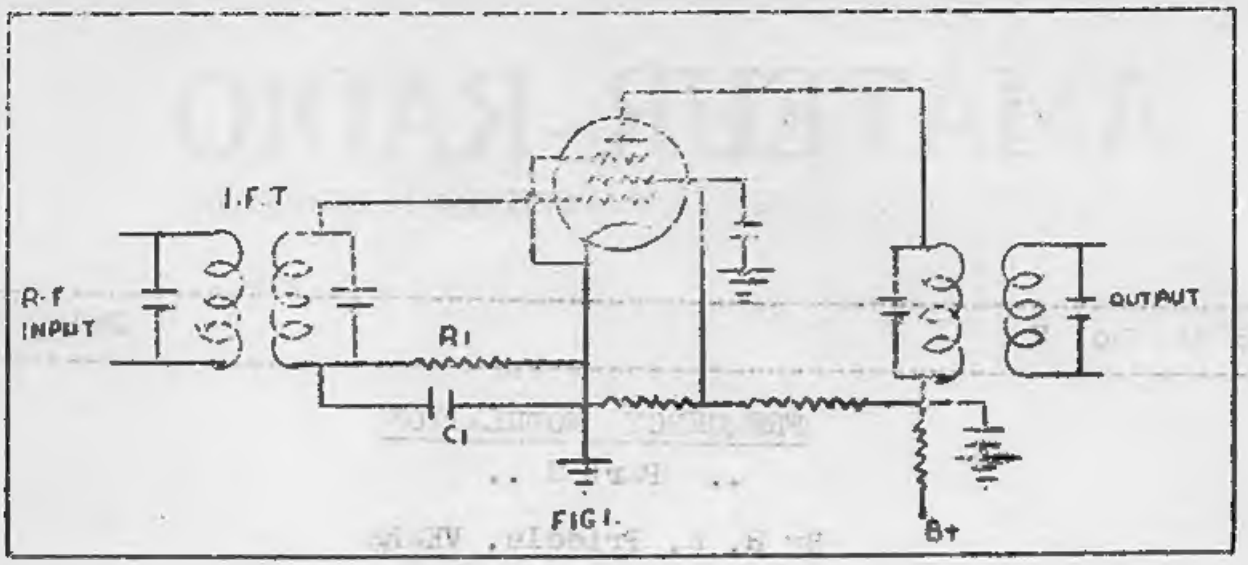


FIG 1.

DISCRIMINATORS .. A typical discriminator circuit is shown in Fig 2. The secondary of the special IFT is centre tapped and the centre is connected back to the plate side of the primary through the condenser C3. Both primary and secondary are aligned on the intermediate frequency.

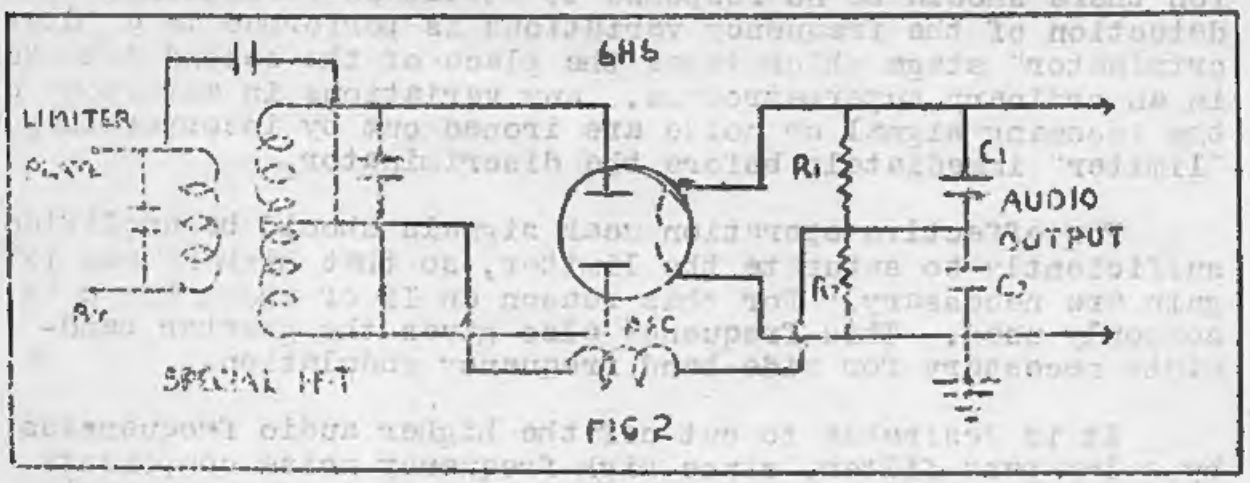


FIG 2

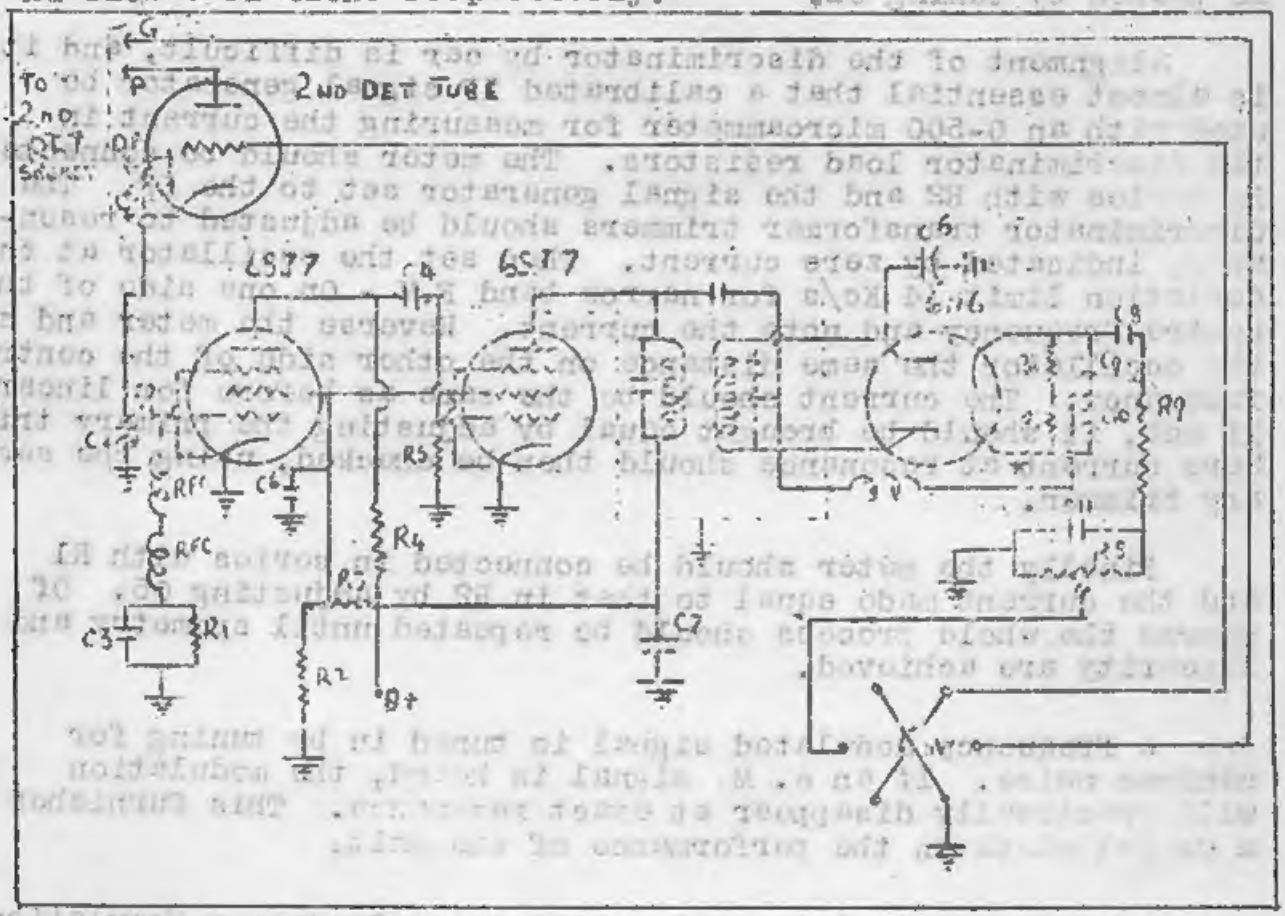
The voltage applied to the diodes has inductive and capacitive components through the IFT and C3 respectively. The phase relationships of these components are such that at resonance the rectified currents are equal but flow in opposite directions through the diode loads R1 and R2, so that the total output voltage is zero.

When the frequency deviates either side of resonance, one diode gets more voltage than the other, so that a voltage appears across the output terminals. This voltage is proportional to the frequency deviation, so that "linear" detection results.

A narrow-band frequency modulation adaptor described in QST for March 1941 should be of interest to those thinking of

trying out frequency modulation. The adaptor can be permanently attached to an existing superhetrodyne, and provides for switching from A.M. to F.M. at will. The second detector tube of the receiver is moved from the receiver to the adaptor, which is plugged into the second detector socket.

The FM limiter is connected across the AM detector, so that both are in operation all the time and it is necessary only to switch the audio outputs. The circuit is shown in Fig 3, and is seen to incorporate a two-stage cascade limiter, the time constants of R1 C3 and R3 C4 being suitable for impulse noise and slow variations respectively.



C1	50mmfd	C11	50 mmfd mica
C2	.0005 mica	R1, R9	50,000 ohm ½ watt
C3	.0001 mica	P2	3000 ohm 1 watt
C4	.00005 mica	R3	70,000 ohm 1 watt
C5	3-30 mmfd	R4	4000 ohm ½ watt
C6, C7	0.1 mfd paper	R5	0.2 meg ½ watt
C8	0.01 mfd paper	R6, R7	0.1 meg ½ watt
C9, C10	.0001 mfd mica	R8	0.5 meg.

The input lead marked DP should have low capacity shielding. This can be made by running hookup wire through some 1/4 inch spaghetti and covering the latter with braid. The audio grid lead marked G should also be shielded.

The series RF chokes and the condenser C1 at the input of the limiter enable the last IF circuit to be re-aligned without having to adjust the IF trimmer. C5 is used to balance the extra plate-to-ground capacity of the lower diode of the 6H6. Correct adjustment will improve the signal-noise response.

As high gain is necessary before the limited stage, it is advisable to realign the receiver to make sure that everything is "on the nose." After plugging in the adaptor, the last IFT can be peaked by tuning C1.

Alignment of the discriminator by ear is difficult, and it is almost essential that a calibrated IF signal generator be used with an 0-500 microammeter for measuring the current in the discriminator load resistors. The meter should be connected in series with R2 and the signal generator set to the IF. The discriminator transformer trimmers should be adjusted to resonance, indicated by zero current. Then set the oscillator at the deviation limit (4 Kc/s for narrow band F.M - On one side of the centre frequency and note the current. Reverse the meter and set the oscillator the same distance on the other side of the centre frequency. The current should be the same as before for linearity. If not, it should be brought equal by adjusting the primary trimmer. Zero current at resonance should then be checked, using the secondary trimmer.

Finally the meter should be connected in series with R1 and the current made equal to that in R2 by adjusting C5. Of course the whole process should be repeated until symmetry and linearity are achieved.

A frequency modulated signal is tuned in by tuning for minimum noise. If an A. M. signal is heard, the modulation will practically disappear at exact resonance. This furnishes a useful check on the performance of the unit.

Part 3 of this interesting article on Frequency Modulation will appear in next month's magazine and will be entitled - "Transmitters."

.....o0o0o.....

REJUVENATING OLD METERS

(From an article by W. R. Triplett in QST)

.....

We all know how difficult it is to obtain new meters at the present time, and it is perhaps harder still to have old meters repaired. In consequency we must use what meters we are lucky enough to have, and also do our own repairs. Some meter repairs are beyond the ability of the average amateur, but in cases where there is nothing seriously wrong, it should not be too difficult to put many of them back in operating condition. The object of this article is to tell you how to go about it.

METER TERMS .. For those not familiar with the terminology, some of the terms used will be explained.

Sticky Meter - One in which the pointer tends to stick somewhere along the scale, when the applied current is gradually changed. The usual cause is lint, dirt or metal chips interfering with the movement.

Friction - A meter is said to have friction when gently tapping the meter while in use causes the reading to increase. It is caused by dirty points and jewels, dull pivots, cracked jewels or lint.

Balance - Whatever the position of the meter the pointer should remain on zero when no current is flowing. If not the meter is said to be off balance. Balance of the movement is restored by adjustment of small weights or by bending a flexible tail weight.

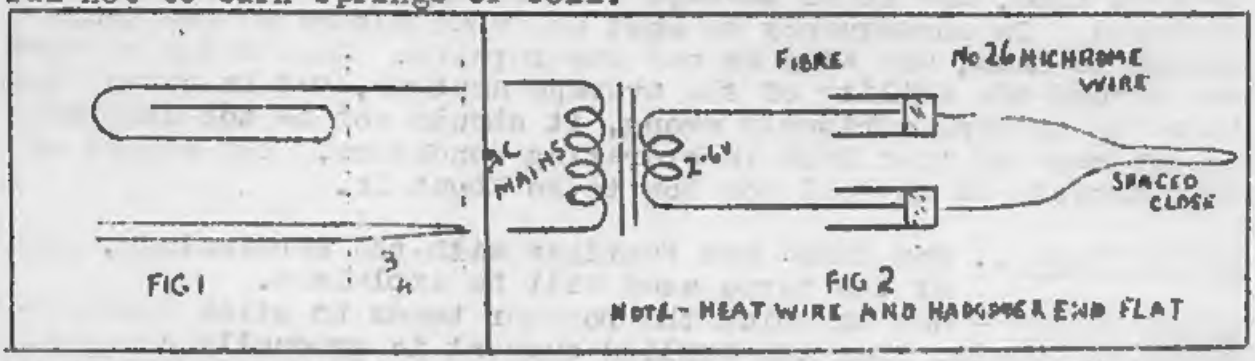
Overthrow - This term applies to the distance the pointer can move beyond full scale or below zero. It should be at least 3% of the total scale.

Accuracy - Commercial tolerances permit variations from the true reading of plus or minus 2%.

REPAIRING D.C. METERS .. Carry out the job on a sheet of glazed white paper, spread out on a well lighted table. Using a small brush, dust off the tools you intend to use. Do not use a cloth or this will spread small pieces of lint and so cause trouble.

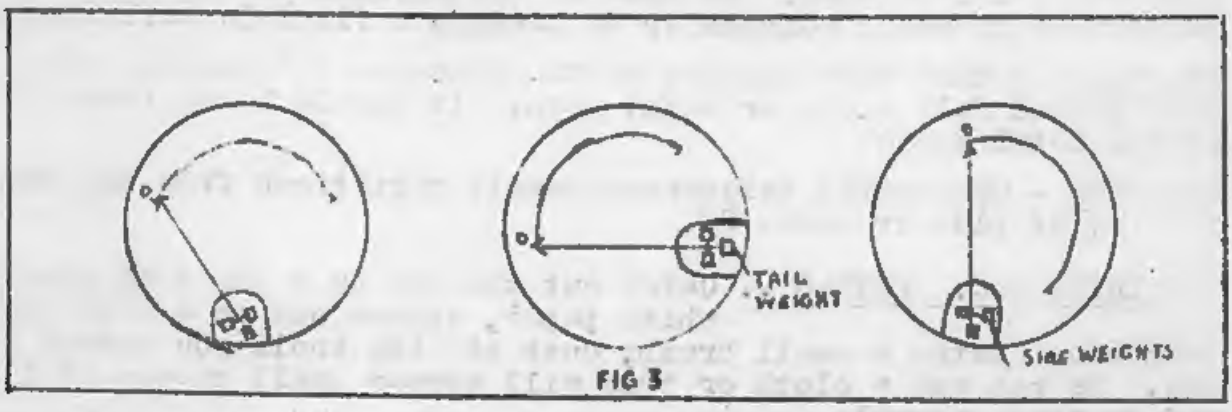
Carefully uncase the meter, but do not unsolder shunts or springs. No attempt should be made to remove the coil and movement from the magnet. If the coil or springs are burned, the job will usually be beyond the amateur, but if they are in good condition use a power supply with potentiometer to run the pointer slowly up and down the scale. Then check for stickiness and friction. Stickiness is usually caused by metal chips inside the polepieces. A tool for removing chips can be made from a metal paper clip (see Fig. 1.)

Carefully insert the straightened end between the pole piece and the coil, being careful not to touch the springs or the coil. The chip will be attracted to the steel clip and may usually be pulled out. Lint touching coil or pointer can also cause stickiness. A magnifying glass should be used to examine thoroughly all possible places where lint may interfere with a moving part. If the lint cannot be removed with tweezers, it may usually be burned out with a heater unit constructed as in Fig. 2. Be careful not to burn springs or coil.



EXCESSIVE FRICTION in a meter may be caused by fuzz or lint. If not, probably the pivots are dull or the jewel cracked. Neither is a home job. Bearings which are too tight may be fixed by loosening the jewel screw a half revolution or so.

BALANCE - Make sure the pointer is perfectly straight and that any repainting of the pointer is completed. The balancing procedure is indicated in Fig 3.



The three steps are (A) set the pointer on zero by means of zero adjustment screw while holding the meter with plane of dial in horizontal position. (B) Adjust tail weight until pointer is on zero while holding meter with plane of dial in vertical position (C) adjust side weight until pointer is on zero while holding meter with plane of dial in vertical position.

OVERTHROW - Adjust pointer stops to get an overthrow of a few divisions above full scale and below zero. Make sure the pointer hits the stop before the moving element hits.

CLEANING - Clean dial with a rubber eraser and inside the case with a brush. When replacing meter in case, be careful not to damage tip of zero adjusting screw.

CALIBRATION - Using the potentiometer set-up mentioned previously, check the calibration against another instrument of known accuracy. If the calibration is not satisfactory, remove the cover and make pencil marks for the points, or paste on a new paper dial and mark off a complete scale.

It is as well to remember that the reading of a D.C. meter will decrease when the meter is mounted on a steel panel, so that meters to be used in such a position should be calibrated while on the panel.

REPAIRING A.C. METERS - Generally the procedure is the same as for DC meters. Usually however, there will be no metal chips due to the absence of a magnet. Most A.C. meters employ a fam swinging in a closely fitted chamber to obtain damping. Dirt or fuzz in this chamber will cause stickiness. Care should be taken not to bend the soft iron vanes as the accuracy of the meter is dependent on the proper placing of these vanes.

.....ooo.....

THE INTERNATIONAL AMATEUR RADIO UNION

Mr. W. C. Ryan, Honorary Fed. Sec., 10th March, 1943.
Wireless Institute of Australia,
P.O. Box No. 1734 JJ
G.P.O. SYDNEY. Australia.

Dear Mr. Ryan,

This will acknowledge receipt of your communication of January 13th, transmitting report of activities of the Federal Executive Wireless Institute of Australia, for the year ending November 30th 1942.

May we, in return, convey our greetings and congratulations on an excellent report. Although the activities of the I.A.R.U. are dormant for the time being, it is heartening to receive a report from a member society and to know that amateur activity and spirit is still very much alive in other parts of the world.

We all join in the hope that the time will not be far distant when amateurs throughout the world will be permitted to resume their normal peace time activity and international amity may be furthered in some measure by the existance and functioning of a reborn I.A.R.U.

Your report will be held for the future resumption of I.A.R.U. activities, and in the meantime our heartiest regards to the Wireless Institute of Australia.

OUR PROBLEM

Last month readers will remember we published a problem in connection with the inaccuracy of an 0-1500 volt meter.

Our suspicions at the time were that the meter was out of balance, and a subsequent examination of the meter proved this to be the case. Readers will probably be interested in the article printed earlier in this issue in regard to rejuvenating meters.

Mr. Bruce Mann VK3BM sent along his theory on the trouble which reads as follows:-

"It appears that meters A and B are accurate while C is only accurate in the region of 250-350 volts, and reads low at low voltages and high at higher voltages. This meter movement must have been knocked 'cockeye' since calibration to within plus or minus 1% at full scale by the maker, as the non linear deflection could only be caused by mechanical derangement. Possibly the soft iron core has moved. An error in the multiplier resistor would cause a constant percentage error at all points throughout the scale.

Without expert attention to the meter movement, recalibration of the whole scale would be the only means of obtaining accuracy.

The usefulness of the meter could be improved however, by simply adjusting the magnetic shunt to make it read accurately on the voltage usually checked, say 1000 volts.

As it can safely be assumed that the Weston wire wound multipliers are accurate, the meter movement minus the multipliers can be set up in series with two suitable wire wound variable resistors (one for fine, the other for coarse adjustments) and a single dry cell, and the incorrect meter adjusted against the correct one, at whatever point on the scale accuracy is desired.

The magnetic shunt is a small slotted iron plate which can be moved to bypass more or less of the magnetic flux across the magnet's poles. It will be found right at the bottom of the meter movement and is fastened by a tiny little hexagon nut.

Alternatively by adding to the multiplier resistor, the same result will be achieved e.g. to correct the reading at 1000 volts. add approximately 150,000 ohms to the multiplier resistor."

....o00....

The Victorian Division has 4 A.C. operated morse code oscillators for sale. These are complete with key and 'phones. For further particulars contact the Divisional Secretary.

....xXx....

SLOUCH HATS and FORAGE CAPS.

By 2YC

Publishing and collecting dope for "Amateur Radio" in peacetime is a pretty arduous task. In wartime it becomes to all intents and purposes another of those seemingly useless tasks which fall to the lot of those of us out of uniform. Yet all hams know that the continuance of a Ham Magazine, no matter how restricted in size is truly keeping the banner of VK Ham Radio flying, and so it seems to me that those VK3 enthusiasts who do overtime (unpaid) every month to produce this Mag., should not be "just taken for granted". They, like you, are doing their particular war jobs for Australia at War, but they are also, still keeping Ham Radio alive till the Service chappies come home...are you doing that too, om??? I mention this, now, as this month we have received four letters letting us know that "Amateur Radio" does serve its purpose to Hams on far battle stations who like to know what is happening to all their old-time friends.

Its marvellous how a laddie interested in getting news can do so. 4RF has already sent in news of 2AMZ and 2HA. Fred, by the way, when last heard of was on his way northward to buy his little daughter the ice cream he had been promising her. He was out here one night and made ones mouth water with tales of the gear we would all like to have. I think I will come up to Canberra, Dave, when its a bit warmer, Hi! Fred is all Walkie-Talkie these days, Dave. By this means he has contacted Harry Young 2AMZ and also F/Lt. White 2HA. The latter has been for a long time in the Middle East and "our Correspondent" has hopes of more news for the column soon. Over in Africa almost the entire network that 2HAwas in charge of was composed of hams and he speaks highly of their efficiency.

4TK Bob Stack came across a copy of "Amateur Radio" and at once become a ham again. Hi! If possible he would like news of 2YC...4HA...4GC and 4SA. The address is LAC Stack. 2...75270 RAAF P.O. 71 Townsville...and that PO doesn't, remember, mean a thing, usually. Bob is still brass-pounding and liking it. How about some more news of things, om?

Jack Howes 2ABS has now been granted his Commission as P/O after the long journey from AC2. He celebrated by getting married so is in the "Walkietalkie" class from now on. Hi! Here is a story about Jack when doing a Rookie Course at the beginning of the War...in the Army. Each lad had to give a lecture on a subject as a finale. Jack's fairly left the brasshats astounded. Those of the VK2 Division who have heard Jack's fluent lectures on many diverse aspects of Radio...could have told them beforehand, Hi!

Eric Colyer now a "Loot" in the Army was at a WIA meeting recently. He has spent a good deal of time up North, but thats about all the news available for publication. Hi.

(Continued on Page 14)

DIVISIONAL NOTES

... New South Wales Division ...

....

The June General Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 17th. Attendance was not as large as at previous meetings.

The Chairman, in declaring the Meeting open welcomed Lieutenant E. Colyer VK2EL. The "Red Terror" was his usual quiet self and very little in the way of news could be obtained from him. It is understood that he could have said quite a lot. Another visitor was Lieutenant Norm Hannaford, back from the Northern Paradise.

A very interesting Lecture on Frequency Modulation was given by the Chairman, Mr. Ray Priddle VK2RA. Members were rather intrigued by the very small amount of Audio required, but rather disappointed when it was pointed out that this system of modulation to a very large degree precluded DX transmissions.

The next Meeting of the Division will be held on Thursday, 15th July, and an invitation is extended to all Amateurs to be present.

...xXx...

EMERGENCY COMMUNICATION NETWORK

Since the last E.C.N. notes were published, considerable changes have taken place with the organisation function and Control of the Network. The S.W.E.C.C. original sponsors of the scheme have handed over to the National Emergency Services the whole of their A.R.P. equipment including the Radio Network. As Radio communication was to a very large degree something new to the N.E.S. organisation several demonstrations have been staged - the first unknown to Operators - for this organisation. These Tests have been outstanding successes, and Colonel Lorenzo, Director of Technical Services has expressed his satisfaction and admiration of the manner in which the Network operated, in no uncertain terms. An Advisory Radio Committee has been set up by N.E.S. and this consists of Messrs. Wetherall, Brislan, Raynor, Priddle and Ryan. Messrs. Wetherill and Brislan should be well-known to you as members of the R.I's staff whilst Sergeant Raynor VK2LJ is attached to Police Radio. Messrs. Priddle and Ryan should need no introduction. The control of the Network will of course remain with the Institute.

This changeover from S.W.E.C.C. to N.E.S. has of a necessity caused some alterations in station sites, the stations effected at the present time being VI2JL, VL2JH and VL2JI. VL2JF may be affected at a later date, but for the present will remain in their

present location. VL2JG will occupy an important place in the Network, relaying traffic from a more distant station. Incidentally, this changeover has been in the air some time, and with its completion, the balance of equipment - including chassis - to complete the Auxiliary Power supply, should be forthcoming very shortly.

With the temporary dislocation of Network activities, the Technical Committee had no option other than to conclude the Message Handling Contest after only two rounds had been completed in the third series:- Points were as follows:-

VL2JL	98	VL2JJ	95
VL2JI	98	VL2JC	93
VL2JG	98	VL2JF	87
VL2JM	97	VL2JB	5
VL2JH	95	VL2JN	0

The Trophy has been won by VL2JI ably operated by Charlie Fryar VK2NP, Alec Little and Jack Fethenbury. This station has been the acme of consistentcy, having won the first round and sharing first place in both the second and third rounds. VL2JL was runner up with two equal firsts and a third and these lads are to be congratulated. These lads 2YV, 2AHV and 2TN are striking examples of team work, and when they are installed at their new location, reckon that daylight will be second. VL2JM operated wholly and solely by Perce Dickson, 2AFB occupied third place. Perce lost quite a few points upon one occasion due to his inability to be present during a full period of traffic handling and also had rather a unique procedure in the early days, but now conforms to standard practice. Wait until you put that beam up Perce.

Here are the total points scored:-

VL2JI	482	VL2JH	418
VL2JL	473	VL2JF	394
VL2JM	463	VL2JG	368
VL2JJ	459	VL2JB	322
VL2JC	430	VL2JN	279

VL2JJ in fourth place was possibly a disappointment. This station made Division "A" in a test prior to the commencement of the exercises, but due I think, to eagerness to do well, several alterations were made that were detrimental to the transmission, particularly quality. Listen fellows! last Saturday, when the daylight test was held, your quality was the best on the band. PLEASE don't try for further improvements.

VL2JC did well to reach fifth place. These boys keep plodding away and despite disappointments, always turn up Quality more than anything else, and occasionally signal strength cost them points.

VL2JH in sixth place made a last minute dash and in the last round was only three points behind the leaders. This was a big improvement. Ern Hodgkins 2EH took his dinner along one Sunday and spent the whole day working on the rig. His efforts were rewarded by the splendid showing made by scoring 48 and 47 in the last two exercises. Hope you do as well from your new location Ern.

VL2JF have made quite a few alterations in the transmitter, and although not as high in the scale as other stations, also showed very great improvement, and it is confidently expected that this station will be placed closer to the top when exercises commence again.

VL2JC eight on the list could not operate one week-end in each series, and this accounts for a very low score. Jeff Thompson has done very well. By the way, Jeff might be sending you up an assistant who is very keen on the code.

VL2JE could not put a consistent signal into Control at any time, but strange to relate they are very strong at the proposed new site. That must be good news for you chaps. I'll bet you hope Control changes location!

VL2JN was equal first in one series was only on twice in another, and in the last didn't operate at all. 2IQ suffers from the disadvantage of being rather a busy man and his other operator was on vacation during the last series. Brother Elgar 2AFQ is now taking a hand and a much better effort is anticipated from now on.

When exercises commence again, each traffic handling period will be divided into three sections. First period telephony, second period I.C.W. and the third telephony with each station having an urgent message to transmit.

Summing up in brief, it can be now said that the E.C.N. is a reliable means of communication, and this is due entirely to the tenacity and courage of the operators concerned.

As members of the Network know, the first report submitted by the R.I. was not altogether a very good one. This did not daunt these chaps, it only placed them upon their mettle. They bucked in with a will, and in a very short time the R.I. was very pleased indeed to submit a further report recommending that the Net be retained.

Every operator in the Network is engaged in a Reserved Occupation, which means that he is carrying out about six other jobs besides his normal one and the fact that the Network is now working efficiently is a credit to them and a splendid example of the will to win, that when the full story is told, will be honored throughout the world of Experimental Radio.

VICTORIAN DIVISION

There have not been any further developments in the proposed ECN in this state except that which was reported last month. Council, at its last meeting, discussed the suggestions put forward by the Authorities, and by this time all country Hams will have received a circular in regard to a country link. Replies to this circular would be appreciated by Council.

The possibilities of "flea-power" local district work was also discussed by Council, and the matter will be referred to the general Meeting, which will be held on Tuesday night 6th July, when it is hoped that there will be a large attendance of Hams.

Members are reminded that the Annual General Meeting will be held at the Rooms 191 Queen St., Melbourne on the first Tuesday in August, the date being 3rd August, so show your interest in the Institute affairs and come along to this meeting.

We have been informed by 3LL who is now located in Hobart, that they are endeavouring, and have received some encouragement, to establish an ECN on the ultra-highs. This of course only covers Hobart. We hope to publish further information at a later date.

3YL..is desirous of selling her two masts, so she informs me. Like the rest of us Austine has ideas of the future and has in mind something a little better. She also tells me that I must be very careful just what I write about her in these notes.

3DX..spends his time these days keeping 3SH on the air, apart from that I don't know what other activities he has.

3TW..is another connected with radio down at 3HA, but George puts in his time in front of the mike. What else are you doing George. I'd like to hear from you.

3JO..was hoping that his case was satisfactory to the authorities when he appeared before the AWC. I guess I'll hear all about it in due course.

3YW..attended the last meeting. He had been spending a few days in the city so called on us.

3HF..also dropped in at the last meeting as he was down on holidays. Harry is another keeping the wheels of Radio turning. This time at 3YB.

.....

Norm Hannaford after a nice trip up to Torres Str is now back in Sydney to do some instructing..oh, yes Norm is still a Lieut.

F/O Alfie Potts stationed at Mt Gambier is anxious to hear from 2AKI so I hope this note will produce the required effect. One of our VK2 ECH lads..Bob Mondel who got his call just too late to ever use it is now up north with an A/A Searchlight Co. He has yet to strike VK4 but has hopes. So far 2CB is the only Ham he has come across. Peter Vesper 2PV a chemist before the war, after a term in New Guinea has had leave and is now back in a better climate up in Queensland. How about a bit of news next time you are in VIS, Peter OM.?

VK4FJ is reported up north in the Milne Bay area working with the silent service. VK4EL is said to be up that way too. How about some news of you OM.?

Jack Lumsdaine now on leave in VK2 sports a nice square rig and looks very fit indeed. Geo Light,2QM (Sgt Pilot) last heard in G-on leave- having a "bum time" in hospital with a carbuncle in a very awkward place--hi! Perhaps it's the English nurses that are the attraction to our VK Hams.

Friends of Ray Carter VK2HC will be pleased to hear that he is at Trinity College, Melbourne, doing his course for a Commission. Ray also did the RAAF the 'long way'..i.e. training trainees, AC2 etc. FB Ray OM--hope you manage this part O.K.

Johnnie Traill is now F/O Traill--and my notes are also trailling still John OM..hi! Morrie Myers has now all the glory of a Squadron Leader..however much that is. How about the 127's Morrie?.

Frank O'Dwyer reckons he wasn't sick..but how do I know,I ask you?. He mentions Crawford Young 6CY and Geo Benwell of 3KQ busy at a northern operational station, while his aid is 6IG It's nice to hear of the VK6's these days. I wish we could get some notes each month from over there. Frank also mentions hearing of Reg Jenkinson, a VK6 whom the war robbed of his call. Reg is well known to all the Sandygroper Hams.

I received a letter from VK3YF over in the west. Unfortunately the arrival of 2YC's 4th Jr Op upset the happy home somewhat and page one is missing pro tem.However from page two I gather he reckons he is just like Dick Giddings 3DG..2½ years at Melbourne W/T and now seeing Australia in large lumps.

Thanks for the letters, chaps, keep them coming as others want the news even ifyou are lucky enough to be so situated that you know everything that happens. Call or write to Jim Corbin,VK2YC.78 Maloney St Mascot.(MU 1092)

THE WIRELESS INSTITUTE OF AUSTRALIA

VICTORIAN DIVISION

191 QUEEN ST., MELBOURNE

Postal Address: BOX 2611W., G.P.O.

SUBSCRIPTION RATES.

Metropolitan	**£1 per annum**
Country	**14/6 per annum**
Defence Forces	**7/6 per annum**

OFFICERS:

President: H. N. STEVENS, VK3JO.
Secretary: R. A. C. ANDERSON, VK3WY.
Treasurer: J. G. MARSLAND, VK3NY.

COUNCIL:

I. MORGAN, VK3DH; T. D. HOGAN, VK3HX;
H. BURDEKIN, K. RIDGWAY.
R. J. MARRIOTT, VK3SI; C. QUIN, VK3WQ.

Meeting Night—First Tuesday in each month.

THE WIRELESS INSTITUTE OF AUSTRALIA

N.S.W. DIVISION

Registered Office:

21 TUNSTALL AVENUE, KINGSFORD

Telephone: FX 3305

Meeting Place:
Y.M.C.A. Buildings, Pitt Street, Sydney.

SUBSCRIPTION RATES:

Full Membership	**10/6**
Service Membership	**7/6**

OFFICERS:

President: R. A. PRIDDLE, VK2RA.
Vice-Presidents: H. PETERSON, VK2HP
P. DICKSON, VK2AFB
Secretary: W. G. RYAN, VK2TI
Treasurer: W. McELREA, VK2UV
Councillors: V. BENNETT, VK2VA; N. GOUGH, VK2NG; R. SMITH, VK2AIU; R. MILLER.

The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

HAMS !

DO YOU WANT TO BE BACK ON THE AIR?

THE WIRELESS INSTITUTE OF AUSTRALIA

is the recognised spokesmen of the

AUSTRALIAN AMATEUR

If you are not a member——

Join Now !

When the time comes that we can reasonably expect to go back on the air, we want to say that we represent——

EVERY ACTIVE HAM

in the Commonwealth.

Strengthen our hand by writing to The Secretary of the Institute in your State to-day.

DIVISIONAL ADDRESSES:

FEDERAL HEADQUARTERS:
BOX 1734JJ, G.P.O., SYDNEY.

NEW SOUTH WALES:
BOX 1734JJ, G.P.O. SYDNEY.

VICTORIA:
BOX 2611W, G.P.O., MELBOURNE.

QUEENSLAND:
BOX 1524V, G.P.O., BRISBANE

SOUTH AUSTRALIA:
BOX 284D, G.P.O., ADELAIDE.

WESTERN AUSTRALIA:
BOX N.1002, G.P.O., PERTH.

TASMANIA:
BOX 547E, G.P.O., HOBART.